

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference OPP030281KR	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/KR 2003/000917	International filing date (day/month/year) 9 May 2003 (09.05.2003)	(Earliest) Priority Date (day/month/year) 1 August 2002 (01.08.2002)
Applicant SK CHEMICALS CO., LTD		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.: _____

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 03/00917-0

CLASSIFICATION OF SUBJECT MATTER

IPC⁷: C07C 63/38, C07C 51/43

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁷: C07C 63/38, C07C 51/43

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

STN:CAS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6291707 B1 (T. V. Lin) 18 September 2001 (18.09.2001) <i>column 8, line 7, 54-64, column 9, lines 43-45; claims.</i>	2-4,7
A		1,5,6
A	US 5344969 A1 (H. Iwane) 6 September 2001 (06.09.2001) <i>claims.</i>	2-4,7
A	WO 1998/012157 A2 (T.V. Lin) 26 March 1998 (26.03.1998) <i>page 4, line 11 - page 9; claims.</i>	2-5
A	EP 1055660 A1 (Mitsubishi Gas Chemical Company Inc.) 29 November 2000 (29.11.2000) <i>page 5, lines 35-47; claims.</i>	2-4,7
A	JP 07 118200 A (Mitsubishi Chem. Corp.) 9 May 1995 (09.05.1995) abstract. (online) (retrieved on 05.04.2004) Retrieved from EPOQUE PAJ Database	2-5

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

„A“ document defining the general state of the art which is not considered to be of particular relevance

„E“ earlier application or patent but published on or after the international filing date

„L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

„O“ document referring to an oral disclosure, use, exhibition or other means

„P“ document published prior to the international filing date but later than the priority date claimed

„T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

„X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

„Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

„&“ document member of the same patent family

Date of the actual completion of the international search

6 April 2004 (06.04.2004)

Date of mailing of the international search report

22 June 2004 (22.06.2004)

Name and mailing address of the ISA/AT

Austrian Patent Office

Dresdner Straße 87, A-1200 Vienna

Facsimile No. 1/53424/535

Authorized officer

HOFBAUER P.

Telephone No. 1/53424/225

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR 03/00917-0

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	Jiao, N. et al. Advances in synthesis and purification technology of 2,6-naphthalenedicarboxylic acid. Shihua Jishu Yu Yingyong 2002, 20(6), 410-416 (Ch). Columbus, OH, USA: Chemical abstracts, Vol. 138, No. 18, 5 May 2003 (05.05.2003), page 1010, column 2-page 1011, column 1, the abstract No. 273227u	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 03/00917-0

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
A				none		
EP	A	1055660	2000-11-29	DE	T 60002782T	2004-03-25
				DE	D 60002782D	2003-06-26
				US	B 6452047	2002-09-17
				JP	A 2001039921	2001-02-13
JP A 7118200A				none		
		2				
US	A	5344969	1994-09-06	EP	A 0551596	1993-07-21
				DE	T 69210790T	1996-10-10
				DE	D 69210790D	1996-06-20
				JP	A 5155807	1993-06-22
				JP	A 5294892	1993-11-09
US	B	6291707	2001-09-18	JP	T 2003510247T	2003-03-18
				US	B 6392091	2002-05-21
				CN	T 1332714T	2002-01-23
				US	A 2002002304	2002-01-03
				EP	A 1131276	2001-09-12

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

YOU ME PATENT & LAW FIRM
Teheran Bldg., 825-33,
Yoksam-dong, Kangnam-ku,
135-080 Seoul
Republic of Korea

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing (day/month/year) 22 June 2004 (22.06.2004)	
Applicant's or agent's file reference OPP030281KR	REPLY DUE within 2 months/days from the above date of mailing
International application No. PCT/KR 2003/000917	International filing date (day/month/year) 9 May 2003 (09.05.2003)
Priority date (day/month/year) 1 August 2002 (01.08.2002)	
International Patent Classification (IPC) or both national classification and IPC IPC ⁷ : C07C 63/38, C07C 51/43	
Applicant SK CHEMICALS CO., LTD	

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I. ☒ Basis of the opinion
 - II. ☐ Priority
 - III. ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV. ☐ Lack of unity of invention
 - V. ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI. ☐ Certain documents cited
 - VII. ☐ Certain defects in the international application
 - VIII. ☐ Certain observations on the international application
3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 01.12.2004.

Name and mailing address of the IPEA/AT Austrian Patent Office Dresdner Straße 87, A-1200 Vienna	Authorized officer HOFBAUER P.
Facsimile No. 1/53424/200	Telephone No. 1/53424/225

Form PCT/IPEA/408 (cover sheet) (July 1998)

WRITTEN OPINION

International application No.

PCT/KR 03/00917-0

I. Basis of the opinion

1. With regard to the elements of the international application:*

☒ the international application as originally filed

☐ the description:

pages , as originally filed

pages , filed with the demand

pages , filed with the letter of

☐ the claims:

pages , as originally filed

pages , as amended (together with any statement) under Article 19

pages , filed with the demand

pages , filed with the letter of

☐ the drawings:

pages , as originally filed

pages , filed with the demand

pages , filed with the letter of

☐ the sequence listing part of the description:

pages , as originally filed

pages , filed with the demand

pages , filed with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages

☐ the claims, Nos.

☐ the drawings, sheets/fig

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as „originally filed“.

WRITTEN OPINION

International application No.
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V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement			
I. Statement Novelty (N)	Claims	1,5,6	YES
	Claims	2-4,7	NO
Inventive step (IS)	Claims	1,5,6	YES
	Claims	2-4,7	NO
Industrial applicability (IA)	Claims	1-7	YES
	Claims	---	NO

Citations and explanations

The following documents have been cited in the Search Report:

D1: US 6291707 B1
D2: US 5344969 A1
D3: WO 98/12157 A2
D4: EP 1055660 A1
D5: JP 07 118200 A
D6: Jiao, N. et al. Advances in synthesis and purification technology of 2,6-naphthalenedicarboxylic acid. Shihua Jishu Yu Yingyong 2002, 20(6), 410-416 (Ch).
Columbus, OH, USA: Chemical abstracts, Vol. 138, No. 18, 05.05.2003, page 1010, column 2-page 1011, column 1, the abstract No. 273227u

None of the documents cited in the search report describes a process for the refining 2,6-naphthalene dicarboxylic acid by recrystallizing the acid using a mixed solvent which comprises as co-solvent an acetate. That means the claims 1,5 and 6 meet the criteria of novelty and inventive step.

However in the document D1 it is already described to use for the purpose of refining 2,6-naphthalene dicarboxylic acid as solvents, besides alcohols, amines (see column 8, lines 54-64) and acetates (see specially column 9, line 43). That means this fact should expressed in claims 2-4 before the characterizing part of these claims. As long as this is not done, the claims 2-4 and claim 7 as dependent claim do not meet the criteria of novelty and inventive step.

Documents D2 – D5 were only cited to define the general state of the art but are not considered to be of particular relevance.

Document D6, which was just published 4 days before the international filing date, does not describe any concrete solvent. Since the original document which is the basis for this abstract is in Chinese, it could not be understood by the examiner. Therefore this

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International application No.
PCT/KR 03/00917

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Box V (page 1)

document can be brought to the attention of the applicant only as part of the general state of the art whatever its real value may be.

Industrial applicability is given.

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

To:

YOU ME PATENT & LAW FIRM
Teheran Bldg., 825-33
825-33 Yoksam-dong, Kangnam-ku
Seoul 135-080
RÉPUBLIQUE DE CORÉE

